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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/807,916	03/24/2004	Eung-Joon Chi	52089/DBP/Y35	3971
23363	7590	02/27/2006	EXAMINER	
CHRISTIE, PARKER & HALE, LLP			KEANEY, ELIZABETH MARIE	
PO BOX 7068			ART UNIT	
PASADENA, CA 91109-7068			PAPER NUMBER	
			2882	

DATE MAILED: 02/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/807,916

Applicant(s)

CHI ET AL.

Examiner

Elizabeth Keaney

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 and 21 is/are rejected.
- 7) ☒ Claim(s) 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/24/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In line 4, an opening in both the gate electrode and the cathode electrode is claimed. Then, lines 7-8 claim the electron emission sources are formed on the surface of the cathode electrode exposed by the openings. It is impossible for both situations to occur, therefore the Examiner is interpreting that an opening is formed only in the gate electrode, thereby exposing the cathode below.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,2,4,5,9 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al. (US Patent Application Publication 2002/0017875; hereinafter Lee).

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Re claim 1: Lee discloses, in figures 2 and 3 and throughout the disclosure, a field emission display comprising:

- a first substrate (8) and a second substrate (10) facing one another and having a predetermined gap therebetween;
- an electron emission assembly (12,16,18) formed on the first substrate for emitting electrons;
- an illumination assembly (24b) formed on the second substrate for displaying images responsive to electrons emitted from the electron emission assembly; and
- a grid plate (6) mounted between the first and second substrates and configured to focus the electrons and having supports (2) mounted to one side of the mask section and extending in a direction toward the first substrate to support the mask section from the first substrate.

Re claim 2: Lee discloses the mask section and the supports being made of the same material (paragraph 44, line 2; paragraph 64, lines 6-7).

Re claim 4: Lee discloses, in figure 2 and throughout the disclosure, the supports are formed between a predetermined array of the apertures (6a) formed in the mask assembly, the supports being formed in at least one of along a direction substantially identical to a direction to the array of the apertures, and along a direction substantially perpendicular to the direction of the array of the apertures.

Re claim 5: Lee discloses, in figure 2 and throughout the disclosure, the supports (2) are formed between at most every other row of the apertures (6a) formed in the mask section and along one direction to thereby form a stripe pattern.

Re claim 9: Lee discloses, a sectional aspect ratio of each of the apertures formed in the mask to be 5:1-1:1 (paragraph 45, line 4).

Re claim 10: Lee discloses, in figures 2 and 3 and throughout the disclosure, the emission assembly comprises:

- electron emission sources (12) and electrodes (16) for causing the emission of electrons from electron emission sources (18);
 - wherein the electrodes includes cathode electrodes (16) and gate electrodes (12) formed in a stripe pattern; and
 - wherein the cathode electrodes and the gate electrodes are substantially perpendicular to one another and insulated from one another by an insulation layer (14).

Re claim 11: Lee discloses the electron emission sources are made of a carbon-based material; and wherein the carbon-based material is any one selected from a group consisting of carbon nanotubes, graphite, diamond, diamond-like carbon and C₆₀

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(Fullerene), or a mixture of at least two of the carbon nanotubes, graphite, diamond, diamond-like carbon and C₆₀ (Fullerene) (paragraph 39, lines 3-5).

Re claim 12: Lee discloses, in figure 3 and throughout the disclosure, the cathode electrodes (16) are formed on the insulation layer (14) over the gate electrodes (12), and the electron emission sources (18) are mounted on the cathode electrodes.

Re claim 14: As best understood by the Examiner, Lee discloses, in figure 12 and throughout the disclosure, the field emission display wherein:

- the gate electrodes (12) are formed on the insulating layer (14) over the cathode electrodes (16);
- an opening is formed in the gate electrodes at each region where the cathode electrodes and the gate electrodes intersect; and
- the electron emission sources (18) are formed on the surface areas of the cathode electrode exposed by the openings.

Re claim 15: Lee discloses, in figures 2 and 3 and throughout the disclosure, the supports (2) are mounted on the insulation layer (14).

Re claim 16: Lee discloses, in figures 2 and 3 and throughout the disclosure, an auxiliary insulation layer (14) formed on an uppermost layer of the first substrate (8); and the supports (2) are mounted on the auxiliary insulation layer.

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Re claim 17: Lee discloses, in figure 2 and 3 and throughout the disclosure, a grid plate for focusing electrons emitted from emitters in a field emission display having a first substrate (8) and a second substrate (10) facing one another with a predetermined gap therebetween, , an electron emission assembly (12,16,18) formed on the first substrate for emitting electrons, and an illumination assembly (24) formed on the second substrate for displaying images responsive to the electrons, the grid plate comprising:

- a mask section (6,20,22) having a predetermined mask section thickness and having a plurality of apertures (6a) through the predetermined mask section thickness in a predetermined pattern such that respective aperture is locatable over a respective pixel region of the field emission display defined by an intersection of a gate electrode (12) and a cathode electrode; and
- a plurality of supports (2) having a predetermined support height, each support being mounted from a first substrate facing side of the mask section in a predetermined non-pixel region between apertures such that the mask section is supported by the supports at a predetermined distance from the first substrate;
 - wherein the predetermined non-pixel region is selected from the group consisting of:
 - a stripe pattern between the apertures (6a) in the direction cathode electrodes are formed, or

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- a strip pattern between the apertures (6a) in the direction gate electrodes are formed, or
 - a lattice pattern between the apertures in the direction cathode electrodes are formed and in the direction gate electrodes are formed;
- wherein a predetermined external voltage is applied to the grid plate to direct the electrons beams through respective apertures toward the second substrate (paragraph 52, lines 4-11).

Re claim 18: Lee discloses, in figures 2 and 3 and throughout the disclosure, the plurality of supports support the mask section above the first substrate by an amount approximately corresponding to the predetermined support height.

Re claim 19: Lee discloses the material forming the mask section and the supports are selected from the group consisting of: a conducting material for the mask section (paragraph 46, lines 1-8) and an insulating material for the supports (paragraph 64, lines 6-7).

Claims 1 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Iijima et al. (US Patent 5,264,758; hereinafter Iijima).

Re claim 1: Iijima discloses, in figure 6 and throughout the disclosure, a display comprising:

- a first substrate (5) and a second substrate (1) facing one another and having a predetermined gap therebetween;
- an electron emission assembly (7) formed on the first substrate for emitting electrons;
- an illumination assembly (6) formed on the second substrate for displaying images responsive to electrons emitted from the electron emission assembly; and
- a grid plate (4) mounted between the first and second substrates and configured to focus the electrons emitted from the electron emission assembly;
 - wherein the grid plate includes a mask section having a plurality of apertures for passing the electrons and having supports (2) mounted to one side of the mask section and extending in a direction toward the first substrate to support the mask section from the first substrate.

The Examiner notes that the limitation "field emission display" has not been given patentable weight because the recitation occurs only in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural

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limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Re claim 8: Iijima discloses the mask section being formed to a thickness of 20-100 μ m (column 10, line 50), and each of the apertures formed in the mask section has a minimal size of 20-100 μ m (column 10, line 54).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 13 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee as applied to claims 1 and 17 above, and further in view of Nakatani (US Patent 6,144,153).

Lee teaches all the limitations as shown above.

However, Lee fails to teach or fairly suggest the supports tapering such that a contacting area of the support toward the mask section is larger than a contacting area of the supports toward the first substrate.

Nakatani teaches a tapered support wherein the contacting area of the support toward a mask section is larger than a contacting area of the support toward the first substrate (figures 7 and 10f).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the supports of Lee to be tapered because it provides greater stability for the mask section thereby preventing misalignment within the device.

Allowable Subject Matter

Claim 20 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The best prior art of record discloses a grid plate in a field emission display wherein the grid plate is supported by a plurality of spacer supports between a first and second substrate. However, the prior art fails to teach or fairly suggest a grid plate in a field emission display wherein the height of the supports is greater than the thickness of the mask, as claimed in claim 20.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Keaney whose telephone number is (571)272-

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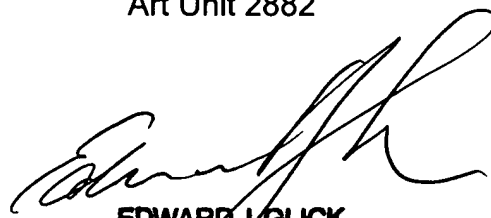
2489. The examiner can normally be reached on Monday, Tuesday, Thursday, Friday 7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571)272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Elizabeth Keaney
Examiner
Art Unit 2882



EDWARD J. GLICK
SUPERVISORY PATENT EXAMINER